

## Introduction to simultaneous equations 1.25.17

Warm up: The average life expectancy is approximately 83 years. If someone earns a dollar for every 30 minutes they are alive. How much would said person earn.

1,454,160

Today we will continue to discuss lines that intersect each other. This started with the project, when we discussed the mill worker and the inventor's earnings. Open up to lesson 24 in mod 4.

Work on exercise 1-3 with a partner.

Go over 1, 2, and 3.

Systems of linear equations are when there are 2 or more linear equations working at the same time.

Derek's case can be represented by a system of equations.

Such as:

$2x + 3y = 30$  and  $x = 5 + y$  We are look for a point  $(x,y)$  that makes both of the systems true.

There are 3 different possible answers. One solution, no solution, or infinitely many solutions. Every equation can be graphed and then used to find an the intersection of the lines if there is one.

Example 1:

Pia types a fifth of a page per minute. If she types  $y$  pages in  $x$  minutes. How can we create an equation for that.

Bret types 3 pages every fifteen minutes. And has already completed one whole page can we create an equation for that.

Let's graph both equations.

Will they ever intercept?

Lines with the same slope will never intercept, how many solutions will we have then?

Example 2:

I can run to the Donut man in fifteen minutes. My dog can run there in 10 minutes. The distance between the starting point and the donut man is 2 miles. I get a 4 minute in front of my dog.

Let's create the equation of my and my dog's movement.

First how can we create the ratio of my speed?  $2/15$

Second can we create an equation for the speed of my dog?  $2/10$

Then we must remember I got a 4 minute head start so we can say my time is  $x+4$  for  $y$  miles.

Creating the equation  $\frac{y}{x+4} = \frac{2}{15}$  and if we simplify this proportion we get  $y = \frac{2}{15}x + \frac{8}{15}$

And my dog is just starting so his equation is  $y = \frac{1}{5}x$ .

Show the graph on desmos?

Will they intersect? If so when? What does that mean?

HW: Mod 4 lesson 24 Exercises 4 and 5